Headquarters Air Combat Command

OCONUS Data Layer for Cultural Resources

DEPARTMENT OF DEFENSE LEGACY PROGRAM

This Briefing is:
UNCLASSIFIED

DoD Legacy Resource Management Program

PROJECT NUMBER 05-266

A Feasibility Study to Develop an OCONUS Data Layer for Cultural Resources

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February 2007

OCONUS Data Layer for Cultural Resources

- **Problem**
- **Feasibility Study to Develop an OCONUS Data Layer for Cultural Resources**
  - **Sample OCONUS Regions and Resources**
  - **Literature Review: DoD and USAF**
  - **Methods: Data Acquisition, Storage, Display**
  - **Results: Central America and Balkans**
  - **Recommendations**

Problem

- **No comprehensive and validated data layers for OCONUS cultural resources currently exist**
- **DoD units working in OCONUS contexts need information to avoid or reduce negative impacts to sensitive cultural resources**
- **Geospatial data on cultural resource locations can be retrieved and viewed during planning for:**
  - **Deployments**
  - **Beddown operations**
  - **Training Events**
  - **Contingencies**
  - **Nation-Building Efforts**
  - **Military Operations Other Than War**

Feasibility Study to Develop a Cultural Resource Layer

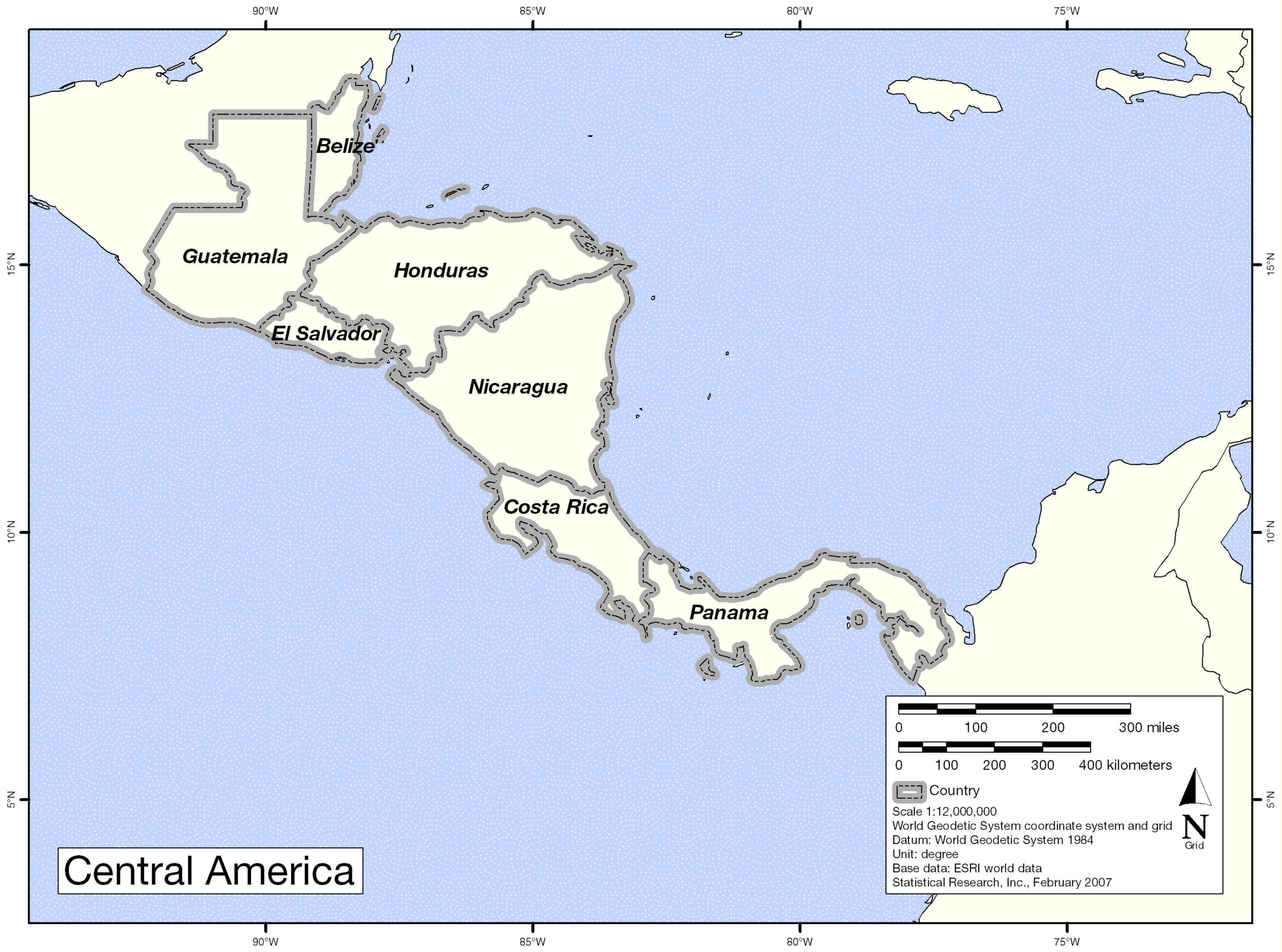
GOALS:

- **Develop and partially populate a database and a GIS data layer for OCONUS regions where DoD personnel are deployed**

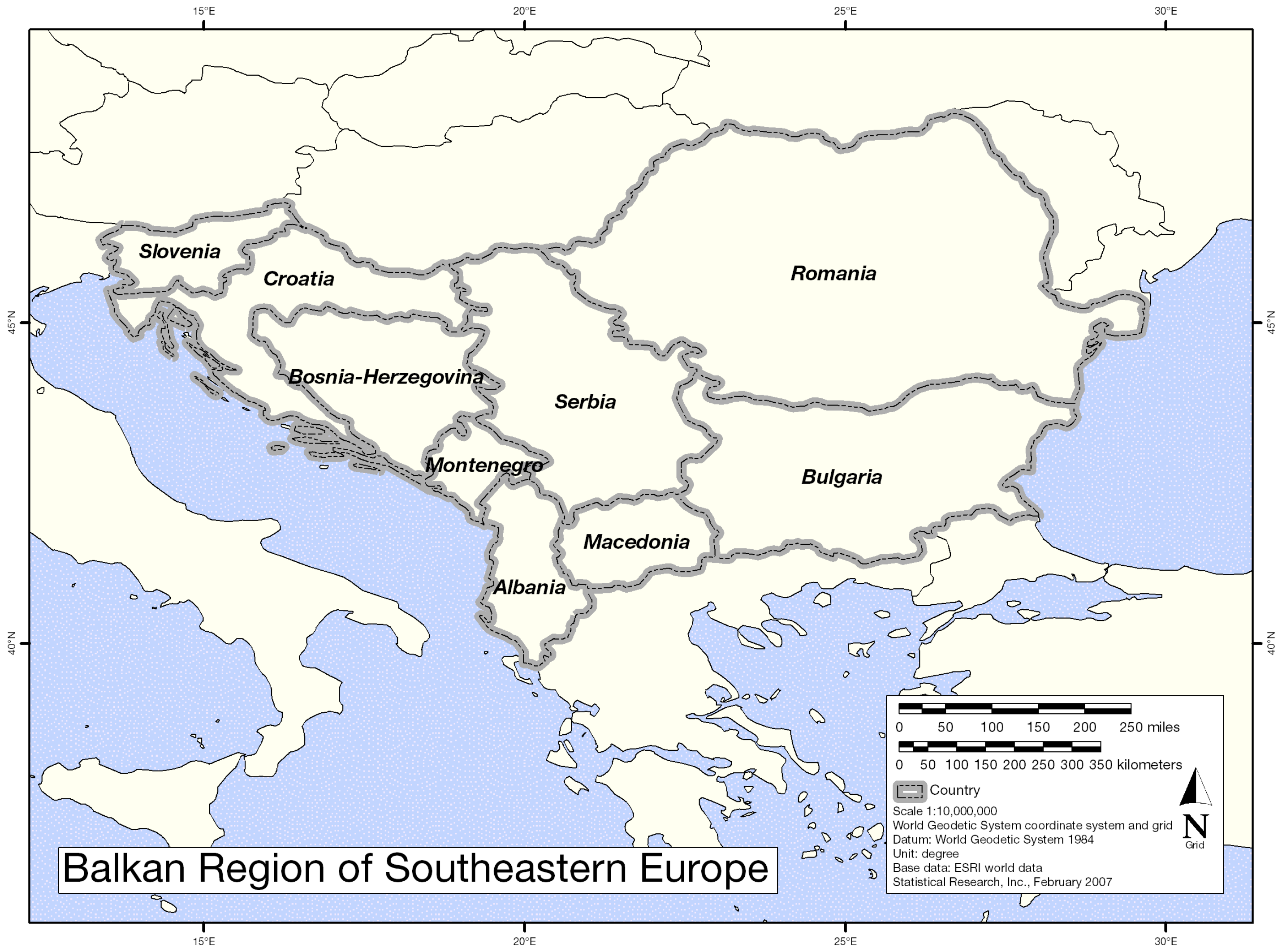
- **Assess the depth, breadth, and availability of needed OCONUS culture resource information**

- **Make recommendations concerning how to efficiently and effectively develop these OCONUS cultural resource data layers in future efforts**

OCONUS Regions selected for the Feasibility Study


90°W
85°W
80°W
75°W
15°N
10°N
5°N
Belize
Guatemala
Honduras
El Salvador
Nicaragua
Costa Rica
Panama
0
100
200
300 miles
0
100
200
300
400 kilometers
Country
Scale 1:12,000,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: ESRI world data
Statistical Research, Inc., February 2007
N
Grid
Central America

OCONUS Regions selected for the Feasibility Study


15°E
20°E
25°E
30°E
45°N
40°N
Slovenia
Croatia
Romania
Bosnia-Herzegovina
Serbia
Montenegro
Bulgaria
Macedonia
Albania
0 50 100 150 200 250 miles
0 50 100 150 200 250 300 350 kilometers
N
Grid

Balkan Region of Southeastern Europe

▭ Country

Scale 1:10,000,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: ESRI world data
Statistical Research, Inc., February 2007

Literature Review on DoD OCONUS Cultural Resources

- **EO 12114: Environmental Effects Abroad of Major Federal Actions and 32 CFR 187: Environmental Effects Abroad of Major Department of Defense Actions**

- **DoDI 4715.5: Management of Environmental Compliance at Overseas Installations**

- **DoD 4715.5_G: Overseas Environmental Baseline Guidance Document (OEBGD)**

- **DoDD 4715.1E: Environment, Safety, and Occupation Health (ESOH)**

Literature Review on USAF OCONUS Cultural Resources

AFPD 32-70: Environmental Quality (EQ)

- **AFI 32-7006: Environmental Program in Foreign Countries**

- **AFI 32-7061: The Environmental Impact Analysis Process (EIAP) = 32 CFR 989**

- **AFI 32-7062: Air Force Comprehensive Planning**

Literature Review Results: Policy, Directives, and Instructions

- Use qualified professional staff to manage cultural resources within the EQ program (Conservation Domain)

- Consult with host-nation authorities on host-nation environmental standards, including cultural resources, and obtain copies of host-nation laws and regulations

- Obtain a list of sites inscribed on the World Heritage List (WHL) and an inventory of sites listed in host-nation cultural heritage registers comparable to the U.S. National Register of Historic Places (NRHP)

Literature Review Results: Policy, Directives and Instructions, continued

- **Comply with AFI 32-7062, which requires the preparation of planning documents, including cultural resource inventories and maps of cultural resource locations**

- **Comply with AFI-7006, which requires adherence to instructions in the OEBGD if Final Governing Standards (FGSs) are not available**

- **Comply with AFI-7061, which requires consideration of impacts to cultural resources when planning substantial land-modifying projects in foreign nations**

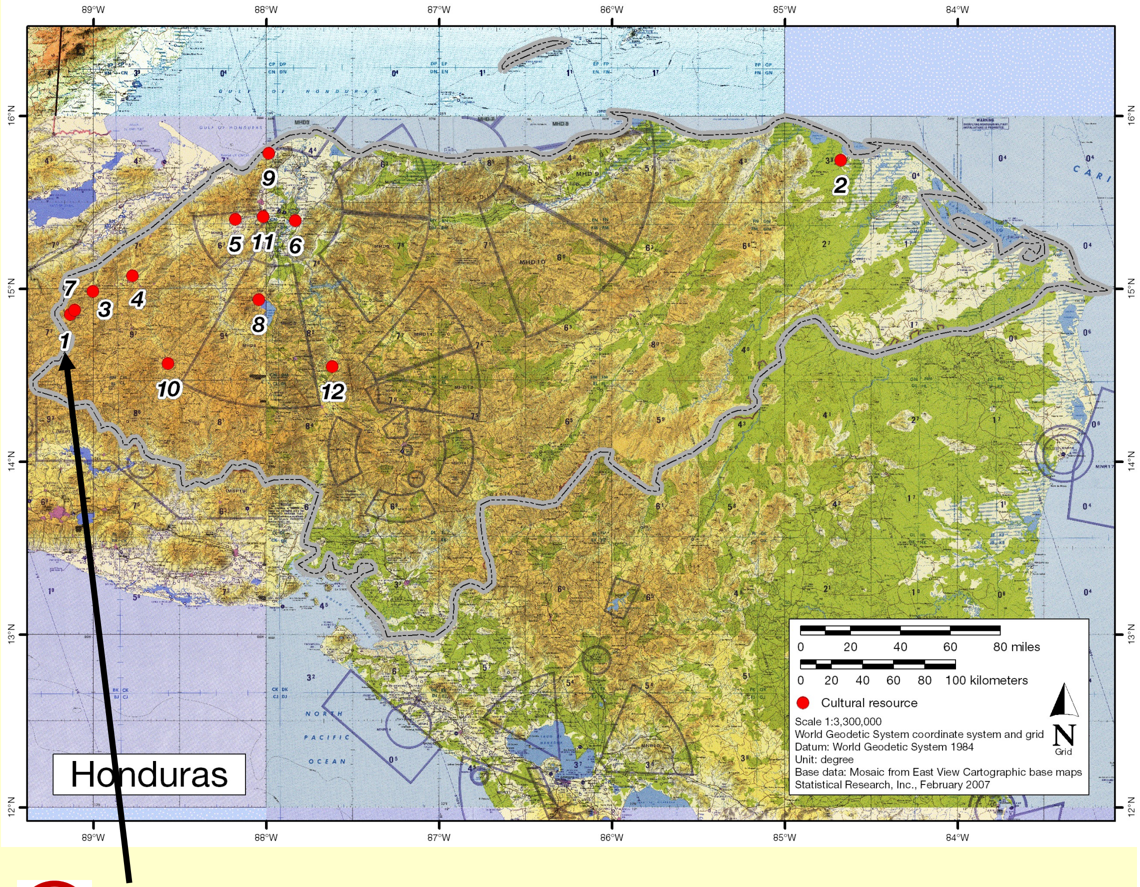
Feasibility Study Methods

- **Identify existing sources of information on OCONUS cultural resources for selected foreign nations**
- **Organize a small sample of cultural resources in a version of the extant Military Cultural Resources Analysis Database (mCRAD)**
- **Acquire digital and geo-referenced imagery for each nation as input into GIS software**

Feasibility Study Methods, continued

- **Obtain location information for cultural resources**
- **Digitize the plotted locations of cultural resources, if existing digital data unavailable**
- **Produce ArcGIS data files for each nation with data contained in an mCRAD-like database**

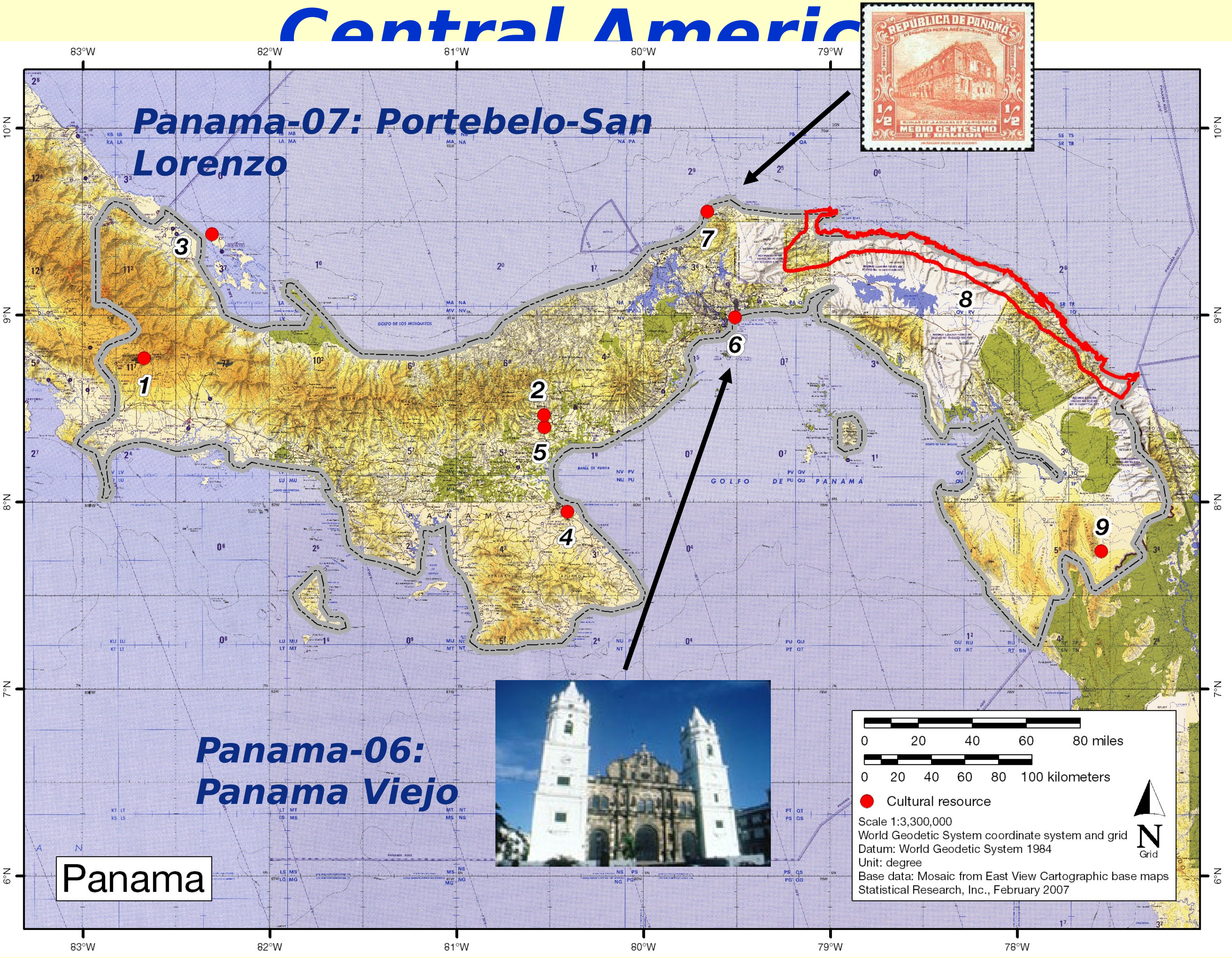
Results: An Example for Central America


89°W
88°W
87°W
86°W
85°W
84°W
16°N
15°N
14°N
13°N
12°N
9
2
5
11
6
7
3
4
8
1
10
12
Honduras
0 20 40 60 80 miles
0 20 40 60 80 100 kilometers
● Cultural resource
Scale 1:3,300,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007
N
Grid

Honduras-01: Ancient Maya Site of Copan

lonelyplanetimages.com

Results: An Example for Central Americ

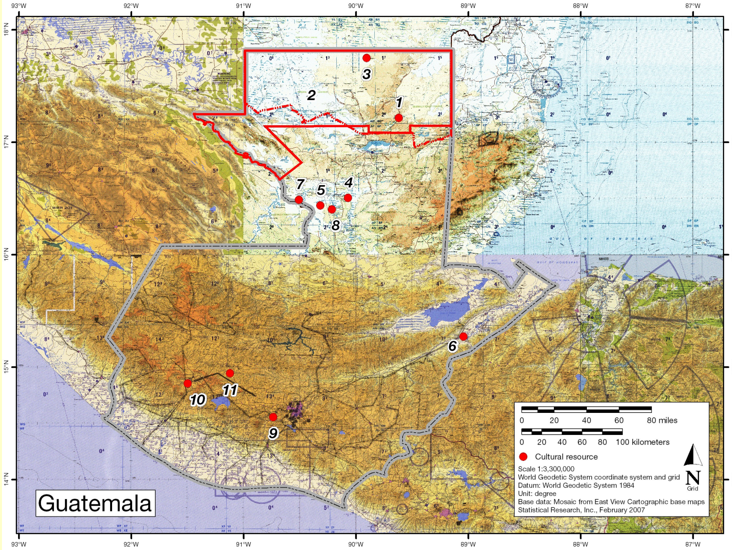


Panama-07: Portebelo-San Lorenzo

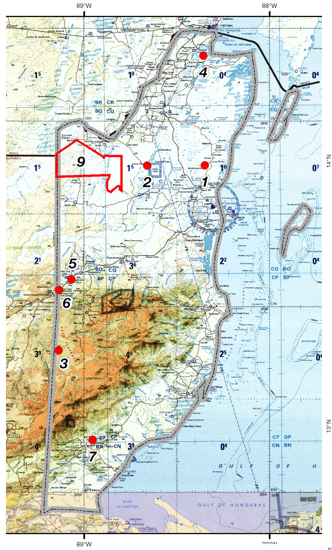
Panama-06: Panama Viejo

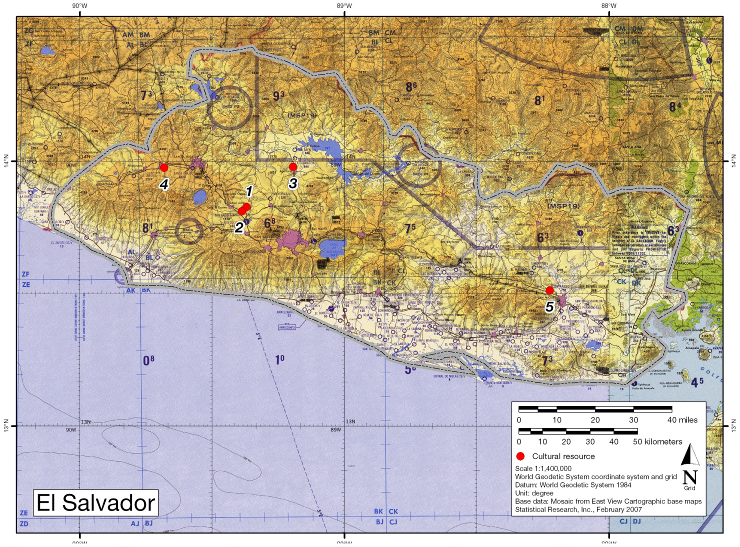
REPUBLICA DE PANAMA
1/2
MEDIO CENTESIMO DE BALBOA
83°W
82°W
81°W
80°W
79°W
78°W
10°N
9°N
8°N
7°N
6°N
1
2
3
4
5
6
7
8
9
GOLFO DE PANAMA
Panama
0 20 40 60 80 miles
0 20 40 60 80 100 kilometers
● Cultural resource
Scale 1:3,300,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007
N
Grid

Sample OCONUS Data Layers for Central American Nations

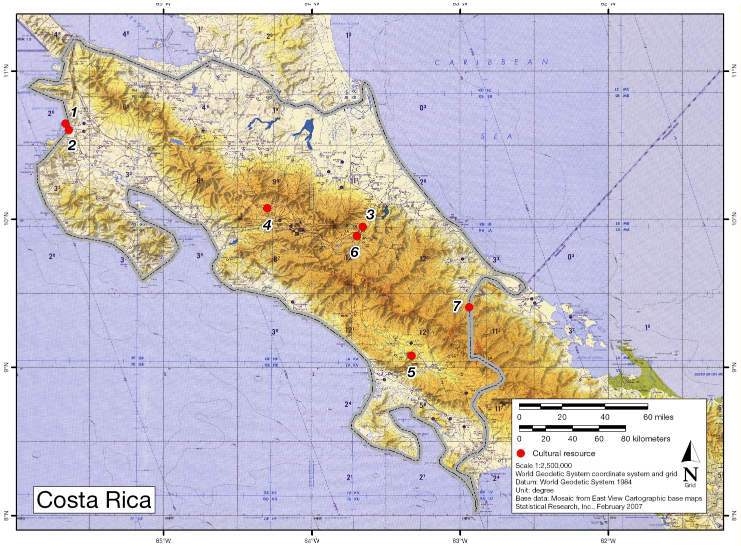

Guatemala
1
2
3
4
5
6
7
8
9
10
11
0 20 40 60 80 miles
0 20 40 60 80 100 kilometers
Cultural resource
N
Grid

Scale 1:3,300,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007

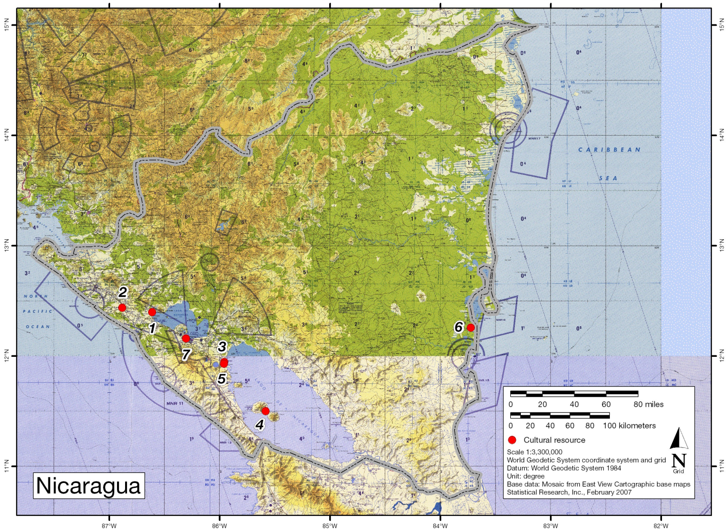



El Salvador
1
2
3
4
5
0 10 20 30 40 miles
0 10 20 30 40 50 kilometers
Cultural resource
N
Grid

Scale 1:1,400,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007

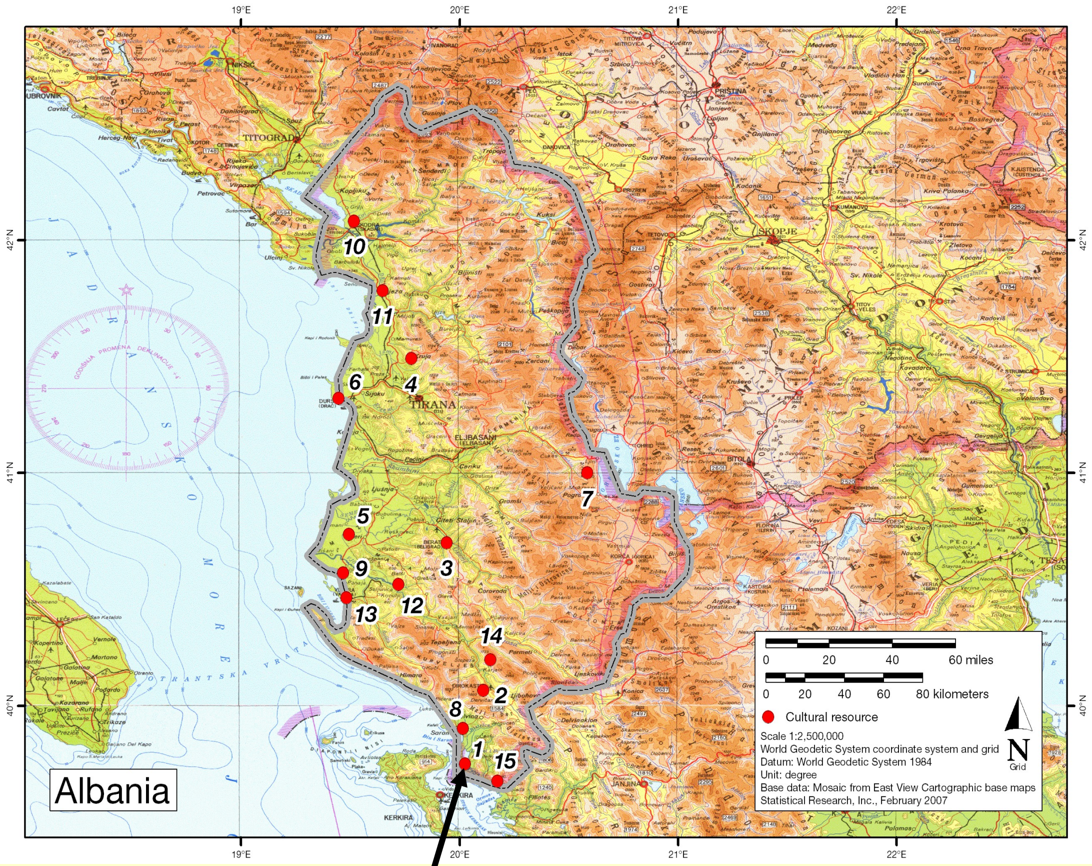

Costa Rica
1
2
3
4
5
6
7
0 20 40 60 miles
0 20 40 60 80 kilometers
Cultural resource
N
Grid

Scale 1:2,500,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007


Nicaragua
1
2
3
4
5
6
7
0 20 40 60 80 miles
0 20 40 60 80 100 kilometers
Cultural resource
N
Grid

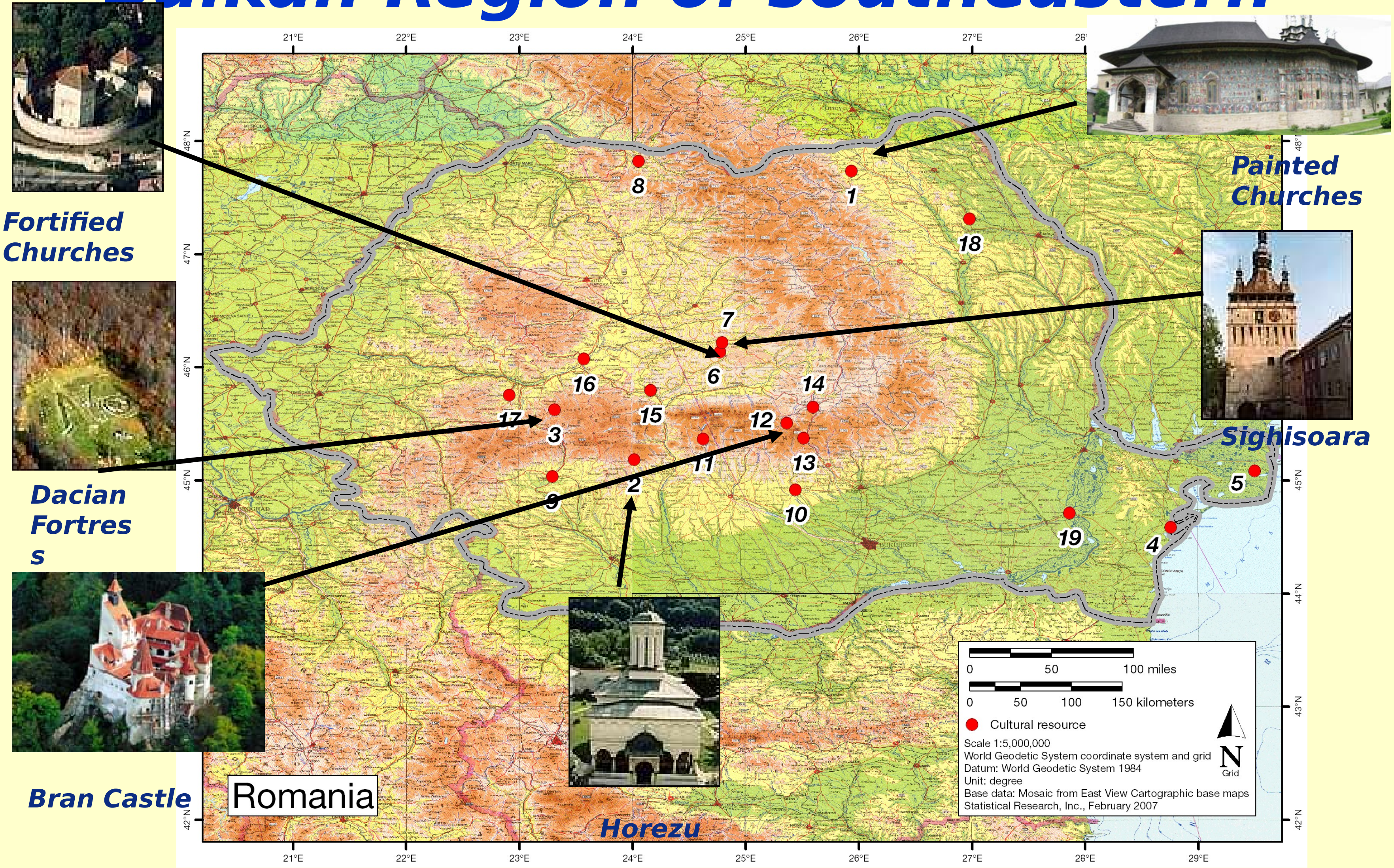
Scale 1:3,300,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007

Results: An Example for the Balkan Region of southeastern Europe

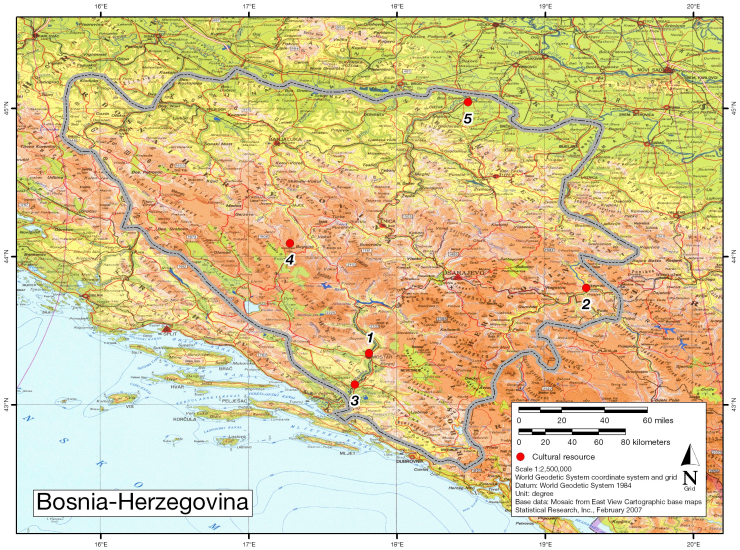

19°E
20°E
21°E
22°E
42°N
41°N
40°N
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
TIRANA
SKOPJE
TITOGRAD
ELBASAN
KERKIRA
Albania
0 20 40 60 miles
0 20 40 60 80 kilometers
● Cultural resource
Scale 1:2,500,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007
N
Grid

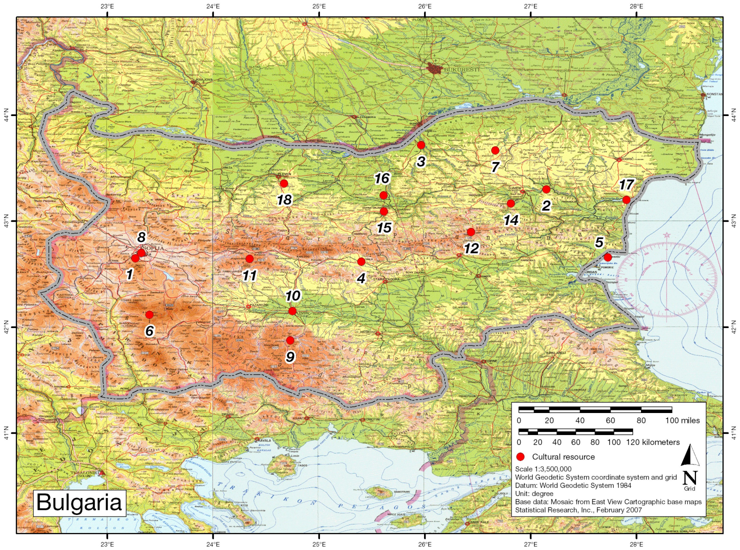
Albania-01: Ancient City of Butrint

Results: An Example for the Balkan Region of southeastern


Fortified Churches
Dacian Fortres s
Bran Castle
Horezu
Painted Churches
Sighisoara
Romania
21°E
22°E
23°E
24°E
25°E
26°E
27°E
28°E
29°E
42°N
43°N
44°N
45°N
46°N
47°N
48°N
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
0
50
100 miles
0
50
100
150 kilometers
● Cultural resource
Scale 1:5,000,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007
N
Grid

Sample OCONUS Data Layers for Balkan Nations


Bosnia-Herzegovina
1
2
3
4
5
16°E
17°E
18°E
19°E
20°E
43°N
44°N
45°N
0 20 40 60 miles
0 20 40 60 80 kilometers
● Cultural resource
Scale 1:2,500,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007
N
Grid


Bulgaria
1
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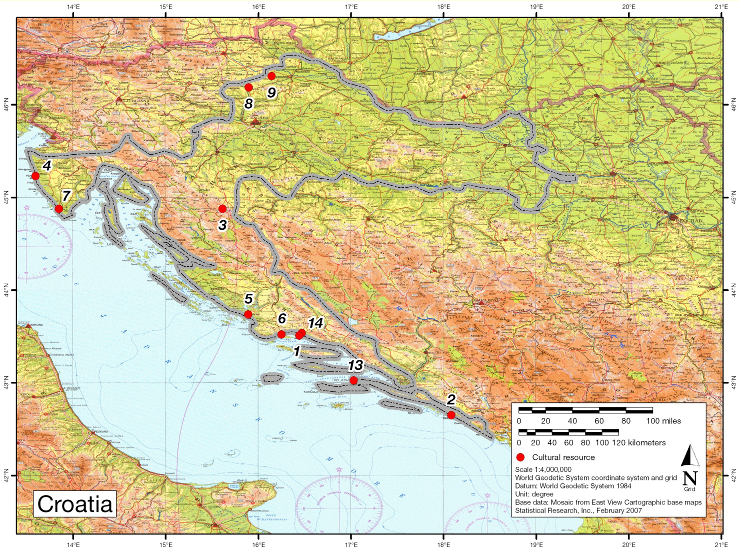
3
4
5
6
7
8
9
10
11
12
14
15
16
17
18
23°E
24°E
25°E
26°E
27°E
28°E
41°N
42°N
43°N
44°N
0 20 40 60 80 100 miles
0 20 40 60 80 100 120 kilometers
● Cultural resource
Scale 1:3,500,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007
N
Grid


Croatia
1
2
3
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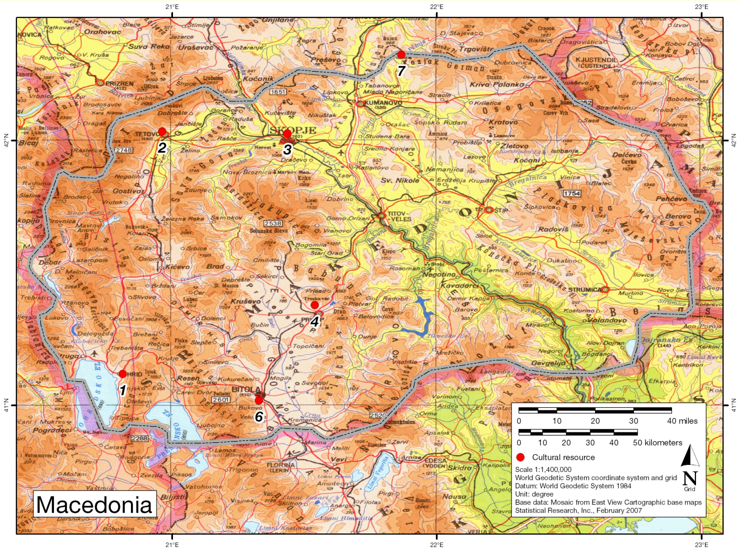
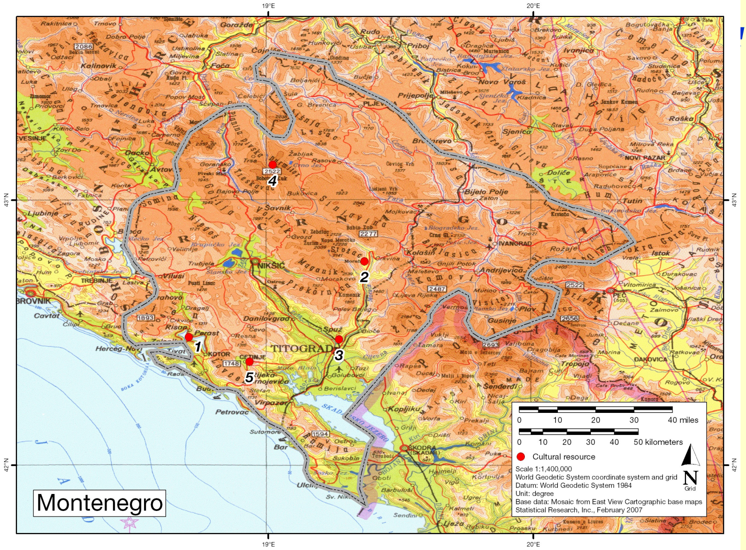
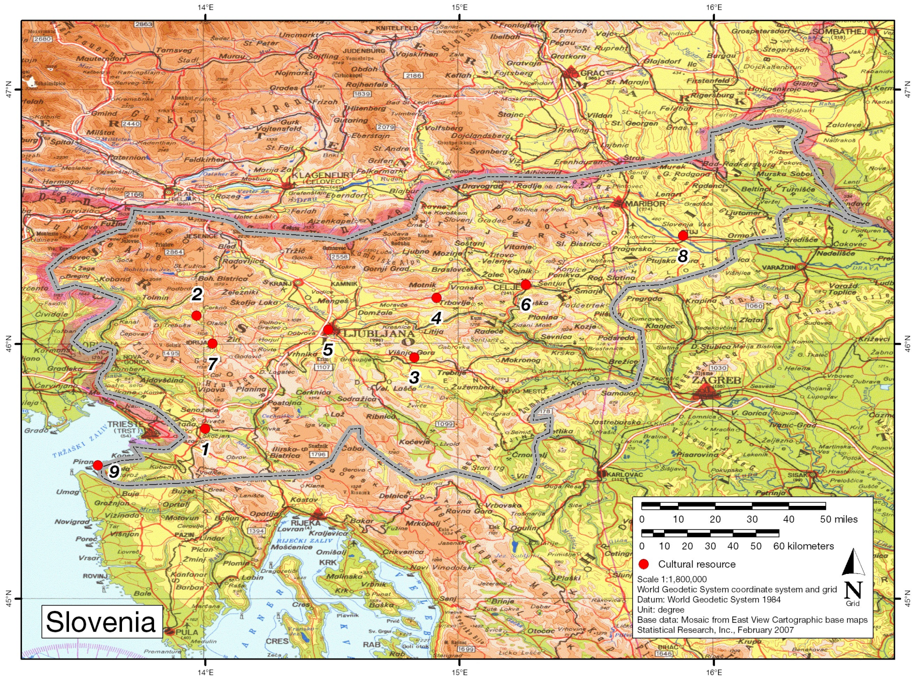
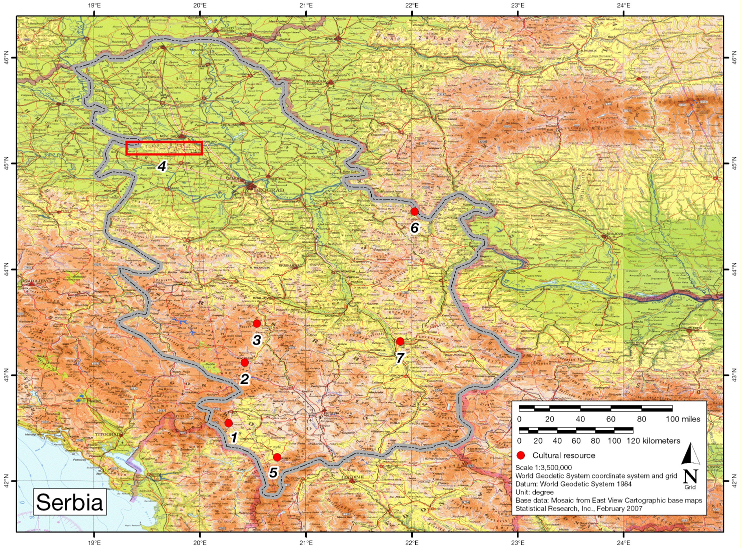
6
7
8
9
13
14
14°E
15°E
16°E
17°E
18°E
19°E
20°E
21°E
42°N
43°N
44°N
45°N
46°N
0 20 40 60 80 100 miles
0 20 40 60 80 100 120 kilometers
● Cultural resource
Scale 1:4,000,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007
N
Grid


Macedonia
1
2
3
4
6
7
SKOPJE
BITOLA
21°E
22°E
23°E
41°N
42°N
0 10 20 30 40 miles
0 10 20 30 40 50 kilometers
● Cultural resource
Scale 1:1,400,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007
N
Grid

Sample OCONUS Data Layers for Balkan Nations, nued


Montenegro
1
2
3
4
5
19°E
20°E
43°N
42°N
0 10 20 30 40 miles
0 10 20 30 40 50 kilometers
● Cultural resource
Scale 1:1,400,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007
N
Grid


Slovenia
1
2
3
4
5
6
7
8
9
LJUBLJANA
ZAGREB
TRIESTE
14°E
15°E
16°E
47°N
46°N
45°N
0 10 20 30 40 50 miles
0 10 20 30 40 50 60 kilometers
● Cultural resource
Scale 1:1,800,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007
N
Grid


Serbia
1
2
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4
5
6
7
19°E
20°E
21°E
22°E
23°E
24°E
46°N
45°N
44°N
43°N
42°N
0 20 40 60 80 100 miles
0 20 40 60 80 100 120 kilometers
● Cultural resource
Scale 1:3,500,000
World Geodetic System coordinate system and grid
Datum: World Geodetic System 1984
Unit: degree
Base data: Mosaic from East View Cartographic base maps
Statistical Research, Inc., February 2007
N
Grid

Results: Addressing Goals

Is it possible to develop and partially populate a database and a GIS data layer for OCONUS regions where DoD personnel are deployed?

YES!

Results: Addressing Goals

What are the depth, breadth, and availability of OCONUS cultural resource data?

Data are variable from nation to nation…

- **Generally considered “cultural heritage resources” and held in high regard by most nations**
- **Often protected by international agreements and national laws**
- **Typically maintained by the host-nation’s Ministry of Culture**

Language and orthography can present formidable barriers to gathering data

Working with host-nation Subject Matter Experts (SMEs) is essential for efficient and effective data collection

Recommendations

1. **Populate a GIS-compatible mCRAD with OCONUS cultural resource data**

2. **Create DoD-wide Guidance that describes the steps used to develop an effective and cost-efficient OCONUS cultural resource data layer that will:**

    - **Facilitate the creation of FGSs for cultural resources in foreign countries**

    - **Provide critical information for DoD planners and decision-makers at all levels of DoD organization**

Recommendations, continued

3. **Comply with multilateral and bilateral agreements signed by the United States, including:**

   - **Prohibitions against illegal excavations**

   - **Prohibitions against illegal collection and exportation of artifacts and other material remains associated with protected cultural heritage sites**

   - **Avoidance of direct impacts to heritage properties identified by the host-nation as protected sites, including WHL properties**

Recommendations, continued

4. **Respect the laws of other nations and their regard for the protection of their cultural heritage in order to:**

   - **Gain respect for the actions of the United States and its military**

   - **Gain cooperation from host-nation partners**